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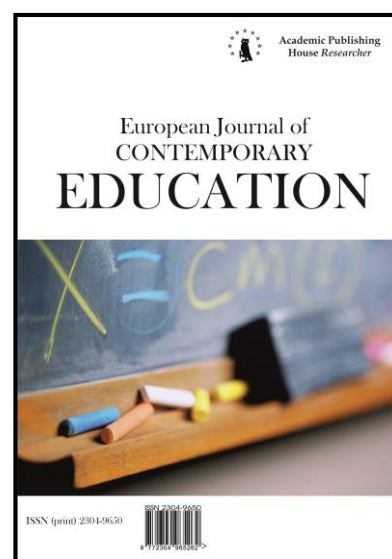
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Specifics of Information Basis of Educational Activity of a Bachelor Student

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Abstract

The discussion of the results of an empirical research of the problem of forming the information basis of educational activity of students studying in pedagogical higher education institution is carried out in the article. The information basis of educational activity is considered by the authors as a subsystem of psychological system of activities implemented in the conditions of educational and professional teaching. It is considered in the context of forming other subsystems of activities (motives, purposes, the program, decision making, educational and important qualities) allocated in a single system in system-genetic approach of V. D. Shadrikov. The authors select the concept of professional formation and realization of personality of Yu.P. Povarenkov and his understanding of psychological structure of the subject of work as a basis for the analysis of forming the information basis of educational activity in the conditions of educational and professional teaching. According to the authors of the article, these approaches allow to carry out the analysis of educational and professional development at the personal (psychological) level whereas other existing approaches are limited only to the subject level of the activity analysis. Formation of information basis of educational activity includes qualitative and quantitative changes on different study courses and stages of educational and professional activity. Using methods of correlation analysis, multiple regression analysis, analysis of the correlation relation the authors set the task to analyze the process of forming the information basis of educational activity in a more detailed way. The methods used in work allowed the authors to specify the existing ideas not only concerning the relationship between success of educational activities and

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psychological features of its information basis, but also study the influence of the latter on success of students' education. Also, the authors carried out the analysis of interference of the activities realized in teaching process on psychological features of its information basis.

Keywords: educational activity, information basis of educational activity, system-genetic approach, success of educational activity.

1. Introduction

Efficiency of any kind of activity such as playing, educational or professional is determined by specific features of formation and organization of psychological system of activity. However, information basis of activities (further – IBA) as one of its components, has a special role in its forming and functioning. After V. D. Shadrikov, we understand IBA as "a set of the information characterizing subject and subjective conditions of activity, and allowing to organize activity according to a vector "purpose-result" ([Shadrikov, 2007: 65-66](#)).

2. Literature Review

Let us concretize the idea of importance of IBA in more detail.

First, adequacy of IBA enables to establish compliance between the idea of the purpose of activity and its result. Secondly, its accuracy gives the chance to allocate concrete indicators of result which have been planned at the stage of purpose statement. Thirdly, completeness of IBA creates conditions for considering all aspects of activity necessary for obtaining the result corresponding to the purpose. Respectively, information about subject and subjective conditions of activity also represents those data which the person has to consider for obtaining necessary result.

In narrow sense it is possible to understand information necessary for activity realization as operating of information units necessary for performance of activity at the subject and effective level ([Shadrikov, 2007: 23](#)). However, recent studies of V. D. Shadrikov and V. A. Mazilov on the problem of man's inner world ([Druzhinina, 2002](#), [Mazilov, 2015](#), [Shadrikov, 2015](#), [Shadrikov, 2013](#)) allow to allocate two types of information providing efficiency of activity in IBA. "When information connected with activity is transferred to the worker by other people or the text, it will be information–value. When information, necessary for activity, is perceived by the worker, taken from his experience, inner world, it will be thought-value. There is a deep connection between these types of information but they shouldn't be confused" ([Shadrikov, 2013: 193](#)). The interrelation of information-value and thought-value is even stronger when "in case of obtaining information from other models and technical means, a man always transfers it into subjective information, allocating it with his understanding and connecting with subjective motivation and experience" ([Shadrikov, 2013: 193](#)). Work with information at this level is implemented in psychological aspect of activity - "as implementation of the conscious purpose, manifestation of will, attention, intellectual properties, etc." ([Shadrikov, 2007: 24](#)).

Taking into account the fact that the subject of this research is the analysis of IBA formation in the process of studying in pedagogical higher education institution, it is necessary to concretize a number of moments.

1) Information-value is acquired by the student at the sensory-perceptual level. At this level there are regularities of formation of sensory-perceptual mechanisms by means of which perception (reflection) of signals bearing professional and important information is carried out ([Shadrikov, 2013: 193](#)). Efficiency of reflection of information-value at this level is determined by properties of productivity of mental processes among which thinking holds a specific place. From our point of view, the latter is connected with the fact that pedagogical activity, being the subject of development while studying in pedagogical higher education institution, requires students to address specific competencies in solving problems. Respectively, "the quantity of tasks solved in the set time and the speed of solution of the given tasks can act as indicators of productivity of thinking... We will characterize quality of thinking according to correctness of the objectives solution. Time spent for the correct solution of tasks, and probability of the correct solution of tasks in the set time interval can serve as indicators of reliability" ([Shadrikov, 2013: 186](#)).

Due to the limited size of this publication we shall not go into more detailed distinctions between pedagogical tasks and the problems of other types of activity. Still it should be noted that the concept of cognitive style of mental activity can be used to describe and explain the features of pedagogical thinking ([Druzhinina, 2002: 283-284](#)).

2) As we have said, information received on the sensory-perceptual level is transferred into subjective information by the student. It is filled with his own understanding and it is connected with the subjective motivation and emotions. As a consequence, the information "moves" to the cognitive level of IBA, where its functional significance and value for the activities performed are established. Again, taking into account the fact that pedagogical activity has significant specifics in comparison with other types of activities, we can assume that the qualitative characteristics of subjective information is related to the students' understanding of themselves and others, attitude to themselves as future teachers, perception of importance for their own evaluations of the activities of the others (students, parents, administrators), etc. Accordingly, this information side can be reflected in the features of self-attitude as a way of the relationship to yourself, expectations of others' relationships, readiness of taking specific actions in relation to yourself.

Problem definition

Considering the above, the following objectives have been set in the present research.

- 1) To study IBA formation of students in pedagogical higher educational institution at the sensory-perceptual level. The activity of thinking takes a leading role in solving cognitive tasks at this level.
- 2) To study IBA formation at the cognitive level, seen in subjective information changes.
- 3) To describe features of the interaction processes of IBA formation at two levels during the teaching of students in pedagogical higher educational institution.

3. Methods of research

The students of pedagogical higher educational institution ($n = 118$) specialising in "Primary education" were enrolled as a sample of the study. The following methods and techniques were used in order to achieve the objectives.

1) To study the features of IBA formation at the sensory-perceptual level, we used the test of J. Kogan, "Comparison of similar drawings» (Carretero-Dios, 2009, Kagan, 1965). It allows to evaluate the degree of extreme manifestations of cognitive style "Impulsivity – reflexivity." This style characterizes the speed of human decision-making in situations when one needs to select the correct option. In this case the differences between different types of people appear not only in speed, but also in quality of an analytical activity in the situation of decision-making (Druzhinina 2002: 284).

2) To study the features of IBA formation at the cognitive level a "self-attitude questionnaire" by Stolin V.V., Pantileeva S.R. (Stolin, 1988) was used. The results of its use allow to describe three levels of self-attitude differing in the degree of generality: 1) global self-attitude; 2) self-attitude differentiated by self-esteem, self-sympathy, self-interest, expectations and attitude towards yourself; 3) the level of specific actions (preparedness) towards yourself (Stolin, 1988).

3) To study the success of educational activity the results of academic progress (further – AP), and the results of expert evaluation of formation of psychological system activity component – information base of educational activity – were used. The experts were lecturers constantly working with students. Now let us analyze the results.

4. Analysis of the results

I. IBA formation at the sensory-perceptual level. From our point of view, IBA at the sensory-perceptual level can be considered as ways of working with information coming from external sources to the student. The latter include the flow of information from lecturers, other students, other sources (different types of literature, etc.). Accordingly, determining the style of cognitive activity as a way of working with information we can consider it in a reflexive – impulsive vector of reflection of the incoming information. The results of the study of cognitive style formation presented in Table 1 and in Drawing 1 allow to identify a number of important points.

Table 1. Dynamics of formation of cognitive style "reflexivity-impulsivity"

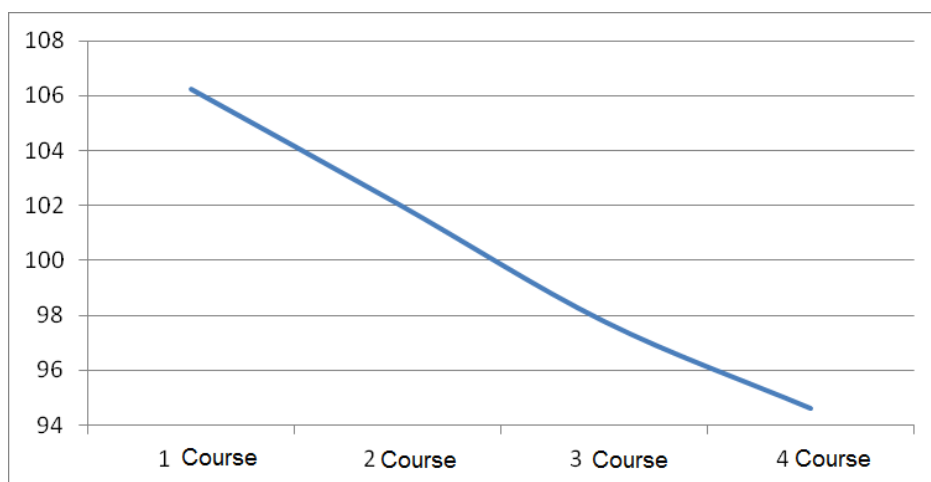
Course of study	Mx^*	MSE	Cv
1 course	106,2	6,059	5,70
2 course	102,1	14,413	14,12

3 course	97,8	14,425	14,75
4 course	94,6	15,077	15,93

Note. Hereinafter: Mx – arithmetic mean; MSE – standard deviation; Cv – variation coefficient.

* - Index is calculated as difference between the number of mistakes in the test, and time of task performance. In order to transfer data from the negative to positive scale data were standardized (z- data-transform) and then transferred to a scale with mean score = 100 and sigma = 15.

First, the dynamics of cognitive style formation is characterized by gradual transition from impulsivity to reflexivity of solving problems for each course. Assessing differences between the courses, we have found out that for each course changes are quantitative in nature (differences between the courses were not statistically reliable – $p > 0,05$). Qualitative, natural changes occur only after the second year of study, when differences between impulsivity and reflexivity are statistically reliable at a high level of significance – $p \leq 0,001$.



Drawing 1. Dynamics of formation of cognitive style "reflexivity-impulsivity"

Secondly, qualitative nature of changing a way of work with information on the second year leads to the change of connection of this method with success of activity (SA). If on the first year of study the differences in progress between "reflexive" and "impulsive" students were not statistically reliable, then on the second and third year students with predominance of reflexive cognitive style (2 course: significance of differences $p \leq 0,05$, 3 course – $p \leq 0,01$) become more successful. The growth of reliability of differences and the figure of T-Vilcokson from the second to third year indicates an increase in the importance of reflexivity in ensuring the success of educational activity. On the 4th course differences cease to have the character of authenticity, which may indicate both adaptation of impulsive students to solution of tasks in this way, and decrease of success of reflective students study.

Third, connection between cognitive style and success of activity can be explained by the following. Development of individual method of working with information of impulsive students may be the reason of successful study. Analysis of the correlation relation between these figures can prove it. The results are shown in Table 2. We see that throughout the entire period of study is the level of formation of cognitive style determines the success of study, and not vice versa.

In our opinion, there is no contradiction between the fact that, on the one hand, the older the course, the more reflexive students become. On the other hand, cognitive style determines success of activity on each course. Terms of activity on each course remain the same for all students. The question is how these conditions are accepted by students, ie, how they work with information. Therefore, it means mental activity determines success of activity, and not vice versa. In our view, this confirms the idea expressed above by V.D. Shadrikov that "in the case of obtaining information from other models and hardware man always transforms it in subjective information, giving it his understanding and connecting it with subjective motivation and emotions» (Shadrikov, 2013: 193).

Accordingly, the problem is not only how the student works with information (reflexive-impulsive), but also how it is converted to a subjective level and how it is connected with the inner world. Let us move on to the analysis of the last point.

Table 2. Evaluation of mutual influence of cognitive style "reflexivity-impulsivity" and the success of educational activity

CS «R-I»	1 course		2 course		3 course		4 course		SA (y)
	$x \rightarrow y^2$	$y \rightarrow x^3$	$x \rightarrow y$	$y \rightarrow x$	$y \rightarrow x$	$y \rightarrow x$	$y \rightarrow x$	$y \rightarrow x$	
	0,77	0,48	0,99	0,65	0,77	0,68	0,96	0,76	

Note.

1 - method of calculating the correlation relation - n is means of assessing the effect;

2 - influence $x \rightarrow y$ - assessment of the impact of cognitive style formation on SA;

3 - influence $y \rightarrow x$ - assessment of the impact of SA on cognitive style formation;

* And **bolding** - predominant influence of cognitive style on SA, and vice versa is marked.

II. IBA formation at the cognitive level. Having chosen self-attitude as an indicator of IBA formation at the cognitive level, we mean the existence of three levels of a student's attitude to himself. 1) "Integral sense of "for" or "against" actually "I" (integral self-attitude); 2) differential attitude to yourself in the form of self-respect, sympathy, interest and expectation of attitude to you from others; 3) readiness to treat to yourself in a certain way and use this relation in behavior and activities (Stolin, 1988). The results of the study of self-attitude formation, shown in Table 3, allow to distinguish the following important points.

Firstly, an integral component of the self-attitude (S) throughout the study period remains almost unchanged. Differences between the 1st and the 2-4th courses are statistically unreliable. It suggests that sudden, dramatic changes in the self-understanding do not take place at university. The changes relate to certain aspects in self-attitude, which are reflected in the results obtained.

Table 3. Self-attitude formation in the period of study in higher education institution

	1 course		2 course		3 course		4 course	
	Mx	Cv	Mx	Cv	Mx	Cv	Mx	Cv
S	90	6	91	6	91	5	91	5
I	77	12	76	19	80	14	82	11
II	80	12	81	14	71	21	84	14
III	56	20	54	26	59	17	51	18
IV	90	11	82	22	90	14	90	16
1	73	20	76	23	71	18	84	11
2	79	22	76	27	76	19	65	23
3	81	16	78	21	79	20	82	19
4	77	13	72	17	79	11	75	17
5	51	28	62	33	58	37	56	41
6	87	16	86	17	88	16	90	16
7	71	24	68	28	76	22	71	20

Note. Hereinafter: S – integral sense of "for" or "against" of "I"; I – self-esteem;

II – self-sympathy; III – expected attitude from others; IV - self-interest; 1 – self-confidence;

2 – attitude of others; 3 – self-acceptance; 4 – self-leadership, self-sequence; 5 – self-blame;

6 – self-interest; 7 – self-understanding.

Secondly, in the dynamics of self-attitude formation, it is possible to allocate three tendencies connected with the period of study at university.

1) *expected attitude of others* (decline on the 2nd year, increase on the 3rd, decline on the 4th), *self-sequence* (decline on the 2nd year, increase on the 3rd or 4th courses), *self-blame* (increase on the 2nd, decline on the 3rd and 4th year) are characterized by the *cyclical* formation.

2) *self-respect* (qualitative increase from the 2nd year to the end of study), *self-interest* (qualitative increase from the 2nd year to the end of study) and *self-confidence* (qualitative increase from the 3rd year to the end of study) are characterized by *positive development* (growth).

3) *self-sympathy* (sharp increase on the 4th year) and *the perception of the relation of others* (continuation of qualitative decline on the 4th year) are characterized by *decline within three years of study*.

Due to the limit of the article the explanation of the received results is the task of another research. However, the results of the analysis of the correlation relationship of components of self-attitude and the success of educational activity are of particular interest. In Table 4, we see that during the entire period of study (with a few exceptions on the third year) the success of study affects the global, differentiated and expressed on the level of actions student's attitude towards himself.

Table 4. Evaluation of mutual influence of the self-attitude components and the success of educational activity

Components of self-attitude	1 course		2 course		3 course		4 course		SA (y)
	$x \rightarrow y^1$	$y \rightarrow x^2$	$x \rightarrow y$	$y \rightarrow x$	$y \rightarrow x$	$y \rightarrow x$	$y \rightarrow x$	$y \rightarrow x$	
S	0,44	0,43	0,65	0,81	0,51	0,58	0,49	0,61	
I	0,36	0,65	0,78	0,80	0,48	0,39	0,38	0,76	
II	0,43	0,54	0,59	0,96	0,38	0,58	0,69	0,76	
III	0,25	0,28	0,28	0,69	0,37	0,57	0,49	0,68	
IV	0,24	0,55	0,38	0,71	0,24	0,63	0,38	0,47	
1	0,23	0,53	0,27	0,72	0,41	0,39	0,43	0,66	
2	0,14	0,55	0,44	0,93	0,41	0,51	0,51	0,58	
3	0,28	0,53	0,27	0,60	0,43	0,25	0,27	0,49	
4	0,13	0,46	0,61	0,82	0,34	0,64	0,32	0,75	
5	0,24	0,43	0,69	0,85	0,35	0,60	0,42	0,85	
6	0,27	0,58	0,17	0,83	0,40	0,65	0,49	0,60	
7	0,27	0,47	0,42	0,55	0,45	0,41	0,57	0,79	

Note

1 - influence $x \rightarrow y$ - assessment of the impact of self-attitude on SA;

2 - influence $y \rightarrow x$ - assessment of the impact of SA on self-attitude formation;

* And **bolding** - predominant influence of the self-attitude on SA, and vice versa is marked.

Thus, there is a problem. At the sensory-perceptual level, ways of working with information (cognitive style) determine the success of educational activity (Table 2), while at the cognitive level the success of activity determines the student's attitude towards himself. That is, the transition of information from objective into subjective is followed by the fact that at the subjective level the success of activity determines understanding and linking of information with subjective motivation and emotions. Here the problem is in need of understanding the following. What is the mechanism of the transition from the influence of the subject on the success of activity (cognitive style on academic progress) to influence of the success of activities on the subject (of academic progress on the understanding of information)? We can assume that only the analysis of the system, including motives, goals, and other components, will allow to understand this mechanism.

5. Conclusion

Summarizing the brief analysis of IBA formation in the period of study at university, it is necessary to draw a number of conclusions.

1) It has been established that IBA formation at the sensory-perceptual level is characterized by consistent growth of reflexivity importance in ensuring the success of educational activity of students.

2) IBA formation at the cognitive level is accompanied by multidirectional tendencies connected both with the student's course of study, and increase or decline of the success of his activities. Changing of self-attitude is characterized by increase, decline, stagnation on various courses of study, and depends primarily on the success of educational activity.

3) The received results allow to formulate the problematic question of how the transition of information from objective (sensory-perceptual) to the subjective (cognitive) level takes place. The solution of the question may be connected with the following possible areas of further study of the problem. First, review of the results obtained in connection with the peculiarities of formation of other components of the psychological system of educational activity (motives, goals, programme, decision-making, educational and important qualities). Secondly, expansion of the object of study (IBA) through the analysis of other cognitive styles (for example, "field dependence – field independence", "rigid – flexible cognitive control", "concrete – abstract conceptualization", etc) (Mazilov, 2015). Thirdly, the inclusion in the analysis of IBA formation the definition of the role of other mental functions (feeling, perception, memory, vision, imagination, attention) and different properties of their productivity (Shadrikov, 2013: 183-186).

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